AMENDMENTS TO THE CLAIMS

1. (Currently amended) An optical moving amount detecting device for detecting an amount of movement of a detection object, the detection object having a surface with certain surface conditions to reflect light cast thereon so that the light has a spatial output distribution, comprising:

a light emitter,

a light receiver,

a first optical system for making light from the light emitter into a linear beam having a length and a width, the length extending in parallel with a direction of movement of ~~a~~ the detection object and casting the linear beam on the detection object,

a second optical system by which a linear reflected beam that is the linear beam reflected from the detection object is made incident on the light receiver,

a storage unit for storing first output waveform signals that are outputted from the light receiver receiving the linear reflected beam at a first time point and that represent an output distribution of the linear reflected beam along a longitudinal direction thereof and that correspond to said surface conditions of the detection object, and storing second output waveform signals that are outputted from the light receiver receiving the linear reflected beam at a second time point and that represent an output distribution of the linear reflected beam along the longitudinal direction thereof and that correspond to said surface conditions of the detection object, and

a moving amount detecting unit for detecting an amount of shift between the first output waveform signals and the second output waveform signals in the longitudinal direction of the linear reflected beams and detecting a moving amount of the detection object on basis of the amount of shift.

2. (Original) An optical moving amount detecting device as claimed in claim 1, wherein the light emitter is composed of a plurality of semiconductor laser devices disposed linearly.

3. (Original) An optical moving amount detecting device as claimed in claim 1, wherein a deflector for deflecting the linear reflected beam from the detection object is provided between the first optical system and the detection object.

4. (Original) An optical moving amount detecting device as claimed in claim 1, wherein the moving amount detecting unit comprises a waveform correcting section for multiplying parts of the first output waveform signals and of the second output waveform signals by a plurality of coefficients according to a light intensity distribution of the linear beam with respect to a longitudinal direction of the linear beams and thus correcting the light intensity distribution of the linear beam with respect to the longitudinal direction.

5. (Original) An optical moving amount detecting device as claimed in claim 1, wherein the moving amount detecting unit

comprises a moving amount calculating section for determining correlation coefficients between first output waveform partial signals that are outputted at the first time point from a first partial area corresponding to part of an image of the linear reflected beam on the light receiver with respect to the longitudinal direction and a plurality of sets of second output waveform partial signals that are outputted at the second time point from a plurality of partial areas corresponding to a plurality of parts of an image of the linear reflected beam on the light receiver, determining a second partial area that results in a highest correlation coefficient at the second time point, and calculating the moving amount of the detection object on basis of an amount of shift between the first partial area and the second partial area.

6. (Original) An optical moving amount detecting device as claimed in claim 5, wherein a size of the first partial area of the light receiver is such that the first output waveform partial signals outputted from the first partial area can be discriminated from signals outputted at the first time point from areas other than the first partial area in the light receiver and wherein a size of a whole area of the light receiver is not smaller than a sum of the size of the first partial area and of a moving amount of an image of the linear reflected beam which amount corresponds to a predetermined moving amount of the detection object.

7. (Original) An optical moving amount detecting device as claimed in claim 5, wherein the size of the whole area of the light receiver is equal to a sum of the size of the first partial area, the moving amount of the image of the linear reflected beam which amount corresponds to the

predetermined moving amount of the detection object, and a predicted amount of positional shift of the detection object from the moving amount.

8. (Original) Electronic equipment comprising the optical moving amount detecting device as claimed in claim 1.

9. (Original) A conveyance processing system comprising:

the optical moving amount detecting device as claimed in claim 1,

a conveying section for conveying the detection object,

a processing section for performing specified processing for the detection object, and

a controller for controlling the conveying section so as to align with a target position a position of the detection object after conveyance, on basis of a moving amount of the detection object that is detected by the optical moving amount detecting device.

10. (Currently amended) An optical movement detector for detecting movement of a detection object, the detection object having a surface with certain surface conditions to reflect light cast thereon so that the light has a spatial output distribution, comprising:

a light emitter,

a first optical system projecting a light beam having a cross section having a length and a width on the detection object such that the length extends parallel to a direction of movement of the detection object,

a light receiver receiving a reflection of the light beam from the detection object,

a storage unit for storing first output waveform signals from the light receiver at a first time and storing second output waveform signals from the light receiver at a second time, wherein the first and second output waveform signals correspond to said surface conditions of the detection object, and

a movement detecting unit for detecting an amount of shift between the first output waveform signals and the second output waveform signals and determining a movement amount of the detection object based on the detected amount of shift.

11. (Currently amended) A method of optically detecting an amount of movement of an object, the object having a surface with certain surface conditions to reflect light cast thereon so that the light has a spatial output distribution, comprising the steps of:

projecting light against the object to form a generally rectangular image having a length and a width such that the length is aligned with a direction of movement of the object;

detecting a first reflection of the generally rectangular image from the object at a first time and outputting first waveform signals related to the first detected reflection and that correspond to said surface conditions of the object;

detecting a second reflection of the generally rectangular image from the object at a second time and outputting second waveform signals related to the second detected reflection and that correspond to said surface conditions of the object;

measuring an amount of waveform shift between the first output waveform signals and the second output waveform signals for a common area within said surface conditions of the object, and

determining from the amount of waveform shift between the first output waveform signals and the second output waveform signals an amount of object shift between the first time and the second time.

12. (Previously Presented) The method of claim 11 including the additional step of deflecting the first reflection of the generally rectangular image.

13. (Previously Presented) The method of claim 11 including the additional steps of:
multiplying a part of the first output waveform signals and a part of the second output waveform signals by a plurality of coefficients according to a light intensity distribution of the linear beam with respect to a longitudinal direction of the linear beam, and
correcting the light intensity distribution of the linear beam with respect to the longitudinal direction.

14. (Previously Presented) The method of claim 11 including the additional steps of:
determining correlation coefficients between first output waveform partial signals outputted at the first time point from a first partial area corresponding to a part of the reflected image of the linear beam with respect to the longitudinal direction and a plurality of sets of second output

waveform partial signals outputted at the second time from a plurality of partial areas corresponding to a plurality of parts of the image of the linear beam,

determining a second partial area from the plurality of partial areas that results in a highest correlation coefficient at the second time, and

calculating the amount of movement of the object based on the shift between the first partial area and the second partial area.

15. (Currently amended) An optical moving amount detecting device for detecting an amount of movement of a detection object, the detection object having a surface with certain surface conditions to reflect light cast thereon so that the light has a spatial output distribution, comprising:

a light emitter,

a light receiver,

a first optical system, including at least one first lens, for making light from the light emitter into a linear beam having a length and a width, the length extending in parallel with a direction of movement of ~~a~~ the detection object and casting the linear beam on the detection object,

a second optical system, including at least one second lens, by which a linear reflected beam that is the linear beam reflected from the detection object is made incident on the light receiver,

a storage unit for storing first output waveform signals that are outputted from the light receiver receiving the linear reflected beam at a first time point and that represent an output

distribution of the linear reflected beam along a longitudinal direction thereof and that correspond to said surface conditions of the detection object, and storing second output waveform signals that are outputted from the light receiver receiving the linear reflected beam at a second time point and that represent an output distribution of the linear reflected beam along the longitudinal direction thereof and that correspond to said surface conditions of the detection object, and

a moving amount detecting unit for detecting an amount of shift of an output pattern appearing in the first output waveform signals based on an output pattern that is substantially identical appearing in the second output waveform signals in the longitudinal direction of the linear reflected beams, said output pattern corresponding to a common area within said surface conditions of the detection object and detecting a moving amount of the detection object on basis of the amount of shift, being the amount of shift of the corresponding common area.